

# SUBJECT INDEX

## A

- Acholeplasma laidlawii*, 423
- Acetaldehyde
  - postharvest disease control, 445, 454
- Agrobacterium radiobacter*, 80
  - biocontrol agent, 78-79, 105, 380-81
  - infection site blockage, 395
- tumefaciens*, 78, 80, 297, 302
  - attachment, 391
  - plant growth substances, 293
  - plant regulated genes, 298-300
  - resistance gene cloning, 248-49
  - T-DNA as insertional mutagen, 258-60
- Agrocin 84, 78, 105
- Alfalfa mosaic virus, 344
- Alginate, 384
- Alkyl pyrones, 83
- Alternaria*
  - alternata*, 439, 442
    - control, 442, 446-47, 452
  - brassicicola*, 448
    - control, 449
  - solani*, 458
  - tenuissima*, 206
    - control, 445
- Ammonia, 83, 110
- Anilazine, 446
- Anoxia, 222-23
- Antagonism, 103
- Antibiosis, 103
  - microbial interactions with pathogens, 105-6
- Antibiosis role in biocontrol, 75-91
  - antibiotics and bacteriocins, 76
    - genetic evidence for role of antibiotics, 76-78
  - genetic evidence for role of bacteriocins, 78-79
  - antibiotics detection, 82
  - conclusions, 86-87
  - culture filtrates use, 81-82
  - enzymes role, 84-85
  - introduction, 75
  - in vitro antibiosis and control, 79
    - correlation lack, 79-80
    - correlation, 80
    - in vitro assays usefulness, 80-81

- potential nontarget effects of
  - antibiosis, 85
  - deleterious effects on beneficial microorganisms, 85-86
  - phytotoxicity, 85
- siderophores role in biocontrol, 82-83
- volatile substances role, 83-84
- Antibiotics
  - detection in soil and in situ, 82
  - genetic evidence for biocontrol role, 76-78
- Armillaria mellea*
  - synergism, 98
- Ascochyta*
  - fabae*, 213
  - lentis*, 214
  - phaseolorum*, 211
  - pinodella*, 213
  - rabiei*, 210
    - variability, 207
- Asparagine, 101, 107
- Aspergillus*
  - nidulans*, 270
  - niger*, 443
    - control, 437
- Azole fungicides, 268-72
- Azospirillum*
  - brasilense*, 391-92
    - movement in soil, 393
  - lipoferum*, 391
    - chemotaxis, 393

## B

- Bacillus*
  - cereus*, 82
  - mycoides*, 82
  - subtilis*, 80, 82, 85
    - biocontrol agent, 381
    - cropping history effect, 386
- Bacterial phytotoxins, self-protection mechanisms, 313-29
  - concluding remarks, 325-27
  - evolution, 323-25
  - genetic relationships, 321-22
  - introduction 313-15
    - assay, 314
  - mechanisms, 315-16
    - cell surface factors, 316-17
    - cytoplasmic membrane, 317-19
  - extracellular factors, 316
  - intercellular types, 319-21

- Bacteriocins
  - genetic evidence for biocontrol role, 78-79
- Barley stripe mosaic virus, 334
- Barley yellow dwarf virus
  - detection, 414, 416
- Bean
  - multiple disease resistance, 212
    - table, 213
- Bean yellow mosaic virus
  - nuclear inclusion proteins, 127
- Beet cryptic virus, 421
- Benomyl, 437-39, 458
  - description and use, 267-68
  - postharvest disease control
    - cabbage, 448-49
    - celery, 449
    - melon, 448
    - stonefruit, 441-42
    - tomato, 446-47
- Benzimidazole, 438, 446, 451
- Bigg, I. C., 19
- Biocontrol of pathogens, 379-407
  - bacterial biocontrol agents, 380-82
  - ecological competence loss, 384
  - effectiveness, 385
  - formulation, 383-84
  - inconsistent performance, 384-87
  - nontarget pathogen interference, 386
  - selection of candidate bacteria, 382-83
  - target pathogen absent, 386
  - variable root colonization, 386-87
- conclusions, 397-98
- introduction, 379-80
- methods of pathogen suppression
  - antibiotics, 395-97
  - induced resistance, 397
  - siderophores, 395
  - substrate competition and niche exclusion, 394-95
- root colonization, 387-88
  - affecting factors, 389-91
  - cell surface polysaccharides, 391-92
  - chemotaxis, 393
  - complex carbohydrate utilization, 394
  - flagella, 392-93

- fimbriae, 392  
 osmotolerance, 393-94  
 process, 388-89  
 rhizosphere competence  
 traits, 391-94  
 see also Antibiosis role in  
 biocontrol
- Biotinylated probes**, 419-20
- Bipolaris*  
*australiensis*, 49  
*hawaiiensis*, 49  
*leersiae*, 49  
*maydis*, 39, 49-50  
 biocontrol, 79  
*oryzae*, 49  
*sacchari*, 47  
*sorghicola*, 49-50  
*sorokiniana*, 48-50  
*stenospila*, 47  
*tropicalis*, 46  
*zeicola*, 49  
*zizaniae*, 49
- Bitancourt, A. A.**, 4
- Black, L. M.**, 332
- BLIGHT FORECAST**, 171
- BLITECAST**, 171
- Boletus variegatus*, 84
- Botryodiplodia theobromae*, 452
- Botrytis*  
*cinerea*, 210, 213, 439, 442-44, 450  
 control, 437, 445-50, 456  
*fabae*, 213  
*squamosa*  
 predictive model, 195
- Bradyrhizobium japonicum*, 302
- fimbriae, 392
- Brome mosaic virus**, 344
- cytoplasmic inclusion protein,  
 131  
 properties of infectious tran-  
 scripts, 343
- Bronopol**, 454
- Brugia malayi*  
 identification, 157
- Buddenhagen, Ivan**, 6
- Bursaphelenchus mucronatus*, 424-25  
*xylophilus*, 424, 426  
 probe, 425
- sec*-Butylamine, 437  
 postharvest disease control  
 blueberries, 445  
 potato, 452
- C**
- Calcium chloride**  
 disease control, 456-57
- Candida albicans*, 270
- Captafol**  
 postharvest disease control  
 blueberries, 445  
 kiwifruit, 442  
 melon, 448  
 tomato, 447
- Carbendazim**, 437  
 disease control  
 melon, 448
- Carbon deprivation**  
 fungistasis, 108-9
- Carbon dioxide**  
 postharvest disease control,  
 445, 456
- Carbon monoxide**  
 disease control, 456
- Carboxin**  
 concept, 269
- Cauliflower mosaic virus**,  
 344  
 gene product, 130
- Cell surface polysaccharides**,  
 391-92
- Cellulase**, 289-90, 394  
 cloned genes, 288  
 export, 290-91
- Cephalosporium gramineum*  
 antibiotic production, 78  
 saprophytic survival, 106
- Ceratocystis ulmi*  
 antibiosis and disease control,  
 79-80
- Cercospora*  
*apii*, 449  
*cajani*, 210  
*canescens*, 214
- Cereal cyst nematodes**  
 ecotypes, 152  
 pathotypes, 151
- CGA 78039**, 454
- Chaetomium*  
*cupreum*, 85  
*globosum*, 80
- Chalaropsis thilavioides*, 450
- Chemical control of disease**,  
 evolution of concepts, 265-83  
 changing concepts of fungi-  
 cide research  
 antibacterial and antiviral  
 activity, 275  
 benomyl and MBC gener-  
 ators, 267-68  
 carboxin, 267  
 control of deep-seated dis-  
 ease, 276  
 ergosterol biosynthesis in-  
 hibitors, 268-72  
 ethirimol, 267  
 Fungicide Resistance Ac-  
 tion Committee, 273
- fungicides that act in-  
 directly, 273-74  
 oomycete fungicides, 272  
 phytoalexin elicitation, 274-75  
 future, 276  
 new modes of biochemical  
 action, 278-79  
 optimizing known activity,  
 276-78
- introduction**, 265-66
- Chemical control of postharvest  
 diseases**, 433-69
- bactericides**, 453-54
- fungicide treatments of de-  
 ciduous fruits**  
 blueberries, 445  
 grapes, 443-44  
 kiwifruit, 442-43  
 persimmon, 442  
 pome fruits, 434, 436-39  
 stone fruits, 439-42  
 strawberries and bushberry-  
 ies, 444-45
- fungicide treatments of root  
 and tuber crops**  
 carrots, 450  
 potatoes, 450-52  
 sweet potato, yam, and  
 sugar beet, 452-53
- fungicide treatments of veget-  
 able crops**  
 cabbage, celery, and on-  
 ions, 448-50  
 melons and cucumbers,  
 447-48  
 tomatoes, 446-47
- future directions**, 457-59
- introduction**, 433-34
- other therapies**, 455-57
- postharvest fungicides**, 435
- Chemotaxis**, 393
- Chickpea**  
 multiple disease resistance,  
 210-11
- Chloramphenicol**  
*Phytophthora* resistance, 59-61
- Chlorella*  
 virus infection, 341-42
- Chlorine**, 457  
 postharvest disease control,  
 441, 447, 450, 453-54
- Chlorofluorocarbons**, 166-67
- Chloroneb**  
*Phytophthora* induction type  
 change, 66-67
- Chlorothalonil**, 437  
 disease control, 446
- Chrysanthemum stunt viroid**,  
 422
- Citrus exocortis viroid**, 422

*Cladosporium herbarum*, 443  
control, 437  
Climate variation and disease  
prediction, 163-81  
climate and climatic variability  
climate forecasts, 168  
climate vs weather, 164  
effects on disease development, 170  
estimating future change, 166-68  
evidence for climatic change, 165-66  
implications, 168  
implications for agriculture, 168-69  
implications for plant pathology, 169-70  
conclusion, 177  
forecast of disease, 170-71  
actual vs predicted index, 176  
examples, 172-74  
meteorological data available, 174-75  
selecting diseases to predict, 171  
value, 175-77  
introduction, 163  
Cloning genes conferring resistance to fungi 245.63  
concluding remarks, 260-61  
gene tagging, 250-51  
cloning a rust-resistance gene from flax, 256-58  
diagram, 251  
in maize, 251-52  
introduced tags in other plants, 255-56  
method involving a nontransposable gene tag, 258-60  
rust-resistance gene from maize, 252-55  
introduction, 245-46  
products of resistance genes, 246-47  
confirmation of a resistance gene, 247  
shotgun gene cloning, 247-48  
diagram, 249  
feasibility, 248-50  
resistance gene cloning, 248  
*Cochliobolus carbonum*, 49  
*heterostrophus* RFLPs, 424  
*saivus*, 94, 100-1, 109, 391  
carbon loss from conidia, 110

conidia recovery, 111  
disease suppression, 105  
longevity, 112-13  
*victoriae*, 49, 101, 110  
pseudomonad chemotaxis, 393  
Colicins, 322  
*Colletotrichum coffeanum*  
disease prediction, 172-73  
*gloeosporioides* control, 445  
*lindemuthianum*, 211-12  
Colloidal gold  
pathogen detection, 412  
COMAX, 191  
Cooke, M. C., 26  
Corn stunt spiroplasma, 418  
Coronatine, 294  
*Corynebacterium sepedonicum* detection, 415  
Cowpea  
multiple disease resistance, 211-12  
Cowpea mosaic virus  
capsoid protein gene, 133  
cytoplasmic inclusion protein, 131  
58 kd protein, 131  
proteinase, 134  
Crop growth-models and disease effects prediction, 183-201  
coupled models, 192  
examples of crop growth-disease models, 194-96  
physiological basis for coupling, 192-94  
crop-growth models, 188  
multilevel explanatory models, 190-92  
same-level descriptive models, 188-90  
future prospects, 196-97  
introduction, 183-84  
multiple interacting constraints on yield, 186  
multifactor yield experiments, 186-87  
surveys, 187-88  
visible disease vs actual disease, 184-86  
Crop residue  
See Soil compaction and crop residue effects on root health  
Curly top virus of sugar beet, 173  
*Curvularia leonensis*, 49  
*pallenscens*, 49  
*ramosa*, 94  
Cyanide, 96

*Cylindrocladium crotalariae*, 101  
Cytochrome P-450, 269-70  
Cytoplasmic pinwheel inclusion structures, 132  
D  
2,4-D, 456  
Daly, J. M., 11  
Dew, 174  
Diaminophenyl indol, 423  
Dichlofluanid, 444  
Dichlorophen, 438  
Dicloran, 448, 458  
postharvest disease control  
cabbage, 448-49  
kiwifruit, 443  
stone fruits, 440-42  
sweet potato, 452  
tomato, 447  
yam, 453  
Diphenylamine, 439  
*Diaporthe actinidiae*, 442  
Disease  
effects prediction  
see Crop growth-models and disease effects prediction  
occurrence prediction  
see Climate variation and disease prediction  
*Ditylenchus dipsaci*, 156  
description, 146-47  
interbreeding of races, 147-48  
morphological distinctions, 147  
serology, 148-49  
*Drechslera*  
*avenacea*, 48  
*avenae*, 48  
*biseptata*, 48  
*dematiodea*, 48  
*dictyoides*, 48-49, 80  
*gigantea*, 40  
*nobleae*, 49  
*siccans*, 48-49  
*triseptata*, 48  
*tritici-repentis*, 42  
*tritici-vulgaris*, 39  
E  
ELISA, 426  
pathogen detection, 410-12, 416  
comparison to dot-blot assay, 418  
El Niño, 168  
*Enterobacter cloacae*, 83  
*Epicoecum purpurascens*, 81  
Epicorazines, 81

- Ergosterol**  
 biosynthesis inhibitors, 268-72
- Erwinia**  
*amylovora*, 304, 454  
 avirulent mutants, 295  
*carotovora*, 83, 446, 450  
 biocontrol, 77  
 biocontrol agents root colonization, 386  
 cloned pectic enzymes genes, 286-87  
 control, 453-54  
 mutants, 295  
*carotovora* subsp. *atroseptica*, control, 457  
 specific monoclonal antibodies, 415  
*carotovora* subsp. *carotovora*, 287-88, 415  
 biocontrol agent screening, 383  
 extracellular enzymes export genes, 290-91  
*chrysanthemi*, 415  
 cloned pectic enzymes genes, 286-87  
 endoglucanase genes, 288  
 extracellular enzymes export genes, 290-91  
 protease, 288  
*herbicola*  
 fireblight control, 79  
*stewartii*  
 extracellular polysaccharides role in virulence, 292
- Erysiphe**  
*graminis* f. sp. *tritici*  
 pyramiding host resistance genes, 371-72  
*polygoni*, 212  
 Etacnazole, 438-39, 448  
 postharvest disease control, 447  
 Ethanol, 84  
 Ethazol  
*Phytophthora* induction type change, 66-67  
 Ethirimol  
 description and use, 267  
 Ethylene, 457  
*Exserohilum*  
*halodes*, 49  
*minor*, 45  
*monoceras*, 45  
*pedicellatum*, 45  
*protrudens*, 45  
*rostratum*, 49  
*turcicum*, 39, 45, 50  
 pyramiding host resistance genes, 374-76
- F**  
 Faba bean  
 multiple disease resistance, 213-14  
 Fawcett, Howard Samuel, 17-21  
 California, 18  
 Bigg, I. C., 19  
 creative insights, 19  
 Florida, 17  
 Fenaminosulf, 448  
 Fimbriae, 392  
 Flagella, 392-93  
 Flax  
 cloning rust-resistance gene, 256-58  
 Fluorescein isothiocyanate, 412  
*Fomes annosus*, 84  
 Fosetyl Al, 438, 458  
 Fungistasis, 107-10  
 carbon loss, 108-9  
 Fungicide Resistance Action Committee, 273  
 Furalaxyl, 438  
*Fusarium*  
*culmorum*, 94, 105, 458  
 longevity, 112-13  
*oxysporum*, 95, 100, 106  
 fungistasis, 110  
 RFLPs and taxonomy, 424  
 siderophore effect in suppression, 395  
 suppressive soils, 113  
*oxysporum* f. sp. *ciceri*, 206, 210  
*oxysporum* f. sp. *cubense*, 94, 96  
*oxysporum* f. sp. *cucumerinum*, 83, 107  
*oxysporum* f. sp. *lentis*, 214  
*oxysporum* f. sp. *lini*, 100  
*oxysporum* f. sp. *niveum*, 113  
*oxysporum* f. sp. *pisi*, 212-13  
*roseum* Culmorum?  
 predisposition, 103  
*roseum* f. sp. *cerealis*, 101  
*sambucinum*, 458  
*semitectum*, 447  
*solani*, 210  
*solani* f. sp. *phaseoli*, 101, 212  
 soil compaction effect on disease, 225  
*solani* f. sp. *pisi*, 220, 237  
 effect of O<sub>2</sub> deficiency in soil, 224-25  
 inoculum distribution, 228-29  
 soil compaction effect, 225-26  
*solani* var. *coeruleum*, 451  
*udum*, 206, 208, 210
- G**  
*Gaeumanomyces graminis* var. *tritici*, 78, 94, 99, 101, 105  
 biocontrol agents, 397  
*P. fluorescens*, 76, 105, 382  
 populations on infected roots, 391  
 root colonization, 386  
 screening, 383  
 effect of siderophores, 83, 395  
 inhibition, 396  
 longevity, 112-13  
 Gamma irradiation  
 disease control, 455  
 Geldanamycin, 396  
 Gene-for-gene relationship, 352-53  
 Genes  
 see Cloning genes conferring resistance to fungi  
*Geotrichum*  
*candidum*, 439, 446-47  
*penicillatum*, 446-47  
 Gibberellic acid, 449, 456  
*Gilbertella persicaria*, 439-40  
*Gleosporium gloeosporioides*, 439  
*Gliocladium*  
*roseum*, 80, 86  
*virens*, 85  
 biocontrol agent, 77  
 viridial phytotoxicity, 85  
 Gliotoxin, 77, 81-82  
 Gliovirin, 77  
*Globodera*  
*pallida*, 149, 424  
 differentiation, 156  
 dna probe, 158  
 pathotypes, 150  
 races, 151  
*rostochiensis*, 149, 424  
 differentiation, 156  
 pathotypes, 150  
 races, 151  
 Glucose, 84-85, 101, 107-8  
 antibiotic biosynthesis requirement, 81  
 Glucose oxidase, 84  
 Glutamine synthetase, 319-21  
 GOSSYM, 191  
 Grain legumes  
 see Multiple-disease resistance in grain legumes  
 Guazatine  
 postharvest disease control  
 melons, 448  
 tomato, 447

H

- Heliothis armigera*, 206  
*Helminthosporium*  
*avenaceum*, 40-41  
*biforme*, 39  
*oryzae*  
disease prediction, 172  
*solani*, 451  
*sorokinianum*, 40-41  
*velutinum*  
description, 38  
*Helminthosporium* spp. taxonomy, 36-56  
classical taxonomy, 46-47  
compatibility tests, 49  
molecular taxonomy, 50  
numerical taxonomy, 48-49  
other approaches to species taxonomy, 48-50  
variability in taxonomic characteristics, 47-48  
conclusions, 51  
correlations with teleomorphs, 46  
differentiation of *Drechslera*,  
*Bipolaris*, and *Exserohilum*, 40-41  
basal cell germination, 42  
germination, 42  
hilum morphology, 43-45  
other criteria, 45-46  
septum ontogeny, 42-43  
table, 41  
graminicolous species, 38  
introduction, 37  
segregate and synonymous  
genera, 39  
*Bipolaris*, 39  
*Drechslera*, 39  
*Exserohilum*, 39  
generic synonymy, 40  
other genera, 39-40  
taxonomic treatments, 50  
type species, 38  
Hemolysin, 292  
*Heterodera*  
*avenae*, 151, 158  
*glycines*, 152-55  
DNA probe, 157-58  
gene flow, 153-54  
index of parasitism, 154  
race identification, 153  
races, 152-53  
*rosochiensis*, 149  
Heterothallism  
see *Phytophthora*, hormonal  
heterothallism and  
homothallism  
Hirst, J. M., 33  
Homothallism  
see *Phytophthora*, hormonal

heterothallism and homothallism

- Host-plant resistance  
see Cloning genes conferring  
resistance to fungi  
Hot water treatment, 455  
*Hydra viridis*, 341  
Hydrogen cyanide, 397  
Hydrogen peroxide, 84  
Hydroxyquinoline, 454

I

- Imazalil, 437-39  
postharvest disease control  
melon, 448  
persimmon, 442  
potato, 451-52  
tomato, 447  
yam 453-53  
Immunofluorescence assay  
pathogen detection, 412  
Infektionsdruck, 97  
Inoculum potential, 96-98  
components, 97  
exogenous energy, 99-100  
inoculum density, 98-99  
Iodophor, 454  
Iprodione, 437-39, 441  
postharvest disease control  
cabbage, 449  
kiwifruit, 442  
potato, 452  
stone fruits, 441-42  
strawberry, 444  
tomato, 446  
Iron, 395  
*Isariopsis griseola*, 212

J

K

- Kekule, August, 19  
Kelman, Arthur, 6  
Kevorkian, A., 2  
*Klebsiella pneumoniae*, 299  
osmotolerance, 394  
Krieger, L. C. C., 26

L

- Laccaria laccata*, 86  
Lactobacillin, 84  
Lecithins  
*Phytophthora* sexual reproduction stimulation, 68-69  
Lentil  
disease resistance, 214  
*Leveillula taurica*, 206  
 $\alpha$ -Linolenic acid, 274

Livingston, Burton E., 18  
*Luttrellia turcica*, 40

M

- Macrophomina phaseolina*, 103  
carbon loss from sclerotia, 110  
pseudomonad chemotaxis, 393  
Maize  
cloning a rust-resistance gene, 252-55  
gene tagging, 251-52  
induction of mutations by  
viruses, 338-39  
Maize chlorotic dwarf virus, 339  
Maize dwarf mosaic virus, 336  
Maize streak virus, 418  
Mancozeb, 446  
Maneb, 448  
McKinney, H. H., 338  
*Melampsora lini*, 370  
cloning a resistance gene, 256-58  
*Meloidogyne*  
*arenaria*, 155, 424  
*hapla*, 155, 424  
*incognita*, 155, 424  
*javanica*, 155, 424  
Metalaxyl, 272, 438, 458-59  
postharvest disease control, 446  
Microbiostasis, 107  
*Monilinia*  
*fructicola*, 82, 439  
benomyl resistance, 442  
control, 457  
dicloranactivity, 441  
*laxa*, 439  
Monoclonal antibodies  
pathogen detection, 413  
Morpholing fungicides, 271-72  
*Mucor*  
*mucedo*, 440, 444, 446  
control, 447  
*piriformis*, 439, 441, 446  
control, 438, 447  
Multiple-disease resistance in  
grain legumes, 203-17  
concluding remarks, 214-15  
examples, 207-8  
chickpeas, 210-11  
dry beans, 212-13  
faba bean, 213-14  
lentil, 214  
mungbean, 214  
pea, 212-13  
pigeonpeas, 208-10  
germ-plasm accessions, 205  
introduction, 203-4  
present status, 204-5

- problems  
 germ plasm availability,  
 205  
 obtaining multiple disease  
 resistances, 206  
 pathogen variability, 207  
 screening methods, 206-7
- Mungbean  
 multiple disease resistance,  
 214  
 Mungbean yellow mosaic virus,  
 214
- Mycocentrospora acerina*,  
 450  
 control, 449
- Mycoplasma hyorhinis*, 423
- Mycosphaerella rabiei*, 207
- N
- Neisseria gonorrhoeae*, 291
- Nematodes, concept of race,  
 145-61  
 biochemical methods of di-  
 fferentiation, 155-57  
 nucleic acid analysis, 157-  
 58  
 conclusion, 158-59  
 diversity within species  
 cereal cyst nematodes, 151-  
 52  
 cyst nematodes, 149-55  
*Diitylenchus dipsaci*, 146-  
 49  
 interbreeding of *Diitylenchus*  
 races, 147-48  
 morphological distinctions  
 of *Diitylenchus*, 147  
 potato cyst nematodes, 149-  
 51  
 race identification of soy-  
 bean cyst nematodes,  
 153  
 root-knot nematodes, 155  
 serology of *Diitylenchus*,  
 148-49  
 soybean cyst nematodes,  
 152-55  
 introduction, 145-46  
 definitions, 146
- Nucleic acid  
 analysis  
 nematode identification,  
 157-58
- probes  
 cloned probes and RFLPs,  
 422  
 synthetic probes, 422  
 uncloned probes, 421-22  
 virus and viroid detection,  
 422-23
- O
- Onchocerca volvulus*  
 differentiation, 157
- Oomycete fungicides, 272-73
- Oort, A. J. P., 33
- Ornithine carbamoyltransferase,  
 319-20, 322
- Oxygen  
 effect on roots, 222-23  
 movement in soil, 222, 238-  
 39
- Oxytetracycline, 454
- P
- Papaya ringspot virus  
 watermelon isolate  
 cytoplasmic amorphous in-  
 clusion protein, 126  
 translation product, 130
- Paramecium bursaria*, 341-42
- Pathozone, 99
- Pea  
 multiple disease resistance,  
 212-13
- Pea enation mosaic virus, 337
- Pectate lyase, 288
- Pectic enzymes, 289-90  
 cloned genes, 286-88
- Penicillium*  
*crustosum*  
 fungicide resistance, 439  
*expansum*, 438-39, 442  
 control, 437-38, 456  
 fungicide resistance, 439  
*italicum* 270
- Pentachloronitrobenzene, 448
- Pepper mottle virus  
 capsoid protein, 125  
 cytoplasmic amorphous inclu-  
 sion protein, 126  
 genome  
 expression, 128  
 map, 128  
 translation product, 130
- Peronospora*  
*parasitica*, 449  
*tabacina*, 173  
*viciae*, 212
- pH  
 root colonization by pseudo-  
 monads, 390
- Phaseolotoxin, 294, 321  
 self protection, 317-18
- Phenazines, 394-97
- Phenylalanine ammonium lyase,  
 457
- o*-Phenylphenate  
 postharvest disease control  
 carrot, 450  
 citrus, 454  
 sweet potato, 452  
 tomato, 447
- o*-Phenylphenol  
 postharvest disease control,  
 447  
 melons, 448
- Phialophora radicola*, 112-13
- Phoma exigua* var. *foveata*, 451
- Phymatotrichum omnivorum*  
 synergism, 98
- Phytoalexin  
 chemical elicitation for con-  
 trol, 274-75
- Phytopathogenic bacteria,  
 molecular genetics of  
 pathogenicity, 285-312  
 extracellular enzymes, 286  
 cellulases, 288  
 export, 290-92  
 pectic enzymes, 286-88  
 proteases, 289  
 synthesis regulation, 289-90  
 extracellular polysaccharides,  
 292-93  
 introduction, 285-86  
 pathogenicity genes encoding  
 unknown products, 294-  
 97  
 plant growth substances 293  
 plant-regulated bacterial  
 genes, 297  
*Agrobacterium*, 298-300  
 host specificity genes, 303-  
 4  
 identification, 301-2  
*Rhizobium*, 300-1  
 toxins, 293-94
- Phytophthora*  
*botryosa*, 65  
*cactorum*, 57, 63, 79  
 control, 438  
 sexual reproduction stimula-  
 tion, 68-69  
*capsici*, 58, 62, 65  
*cinnamomi*, 57, 62-63, 65,  
 84, 113  
 genetic exchange absence,  
 61  
 induction type change, 66  
 monoclonal antibodies, 416  
 sexual reproduction regula-  
 tion, 58  
*citricola*, 57, 63, 65  
*citrophthora*, 62  
*colocasiae*, 58, 62, 65  
 $\alpha$  hormone production, 67  
 induction type change, 66  
*cryptogea*, 58, 62, 65  
*dreschleri*, 58, 62, 65  
*dreschleri* f. sp. *cajani*, 208-9  
*heveae*, 63  
*humicola*, 63

- infestans*, 57-58, 62, 65, 458  
control, 446  
*insolita*, 63  
*katsurae*, 63  
*megakarya*, 58, 62,  
induction type change, 66  
*megasperma*, 57-58, 62-63  
metalaxyl effect, 272  
soil compaction effect, 226  
*megasperma* f. sp. *glycinea*,  
226  
biocontrol agent screening,  
383  
*palmivora*, 57, 62, 65  
genetic exchange absence,  
61  
sexual reproduction regula-  
tion, 58  
*parasitica*, 62, 65, 446  
genetic exchange absence,  
61  
 $\alpha$  hormone production, 67-  
68  
induction type change, 66  
sexual reproduction regula-  
tion, 58  
sexual reproduction stimula-  
tion, 68-69  
*syringae*  
control, 438  
*Phytophthora*, hormonal  
heterothallism and  
homothallism, 57-73  
hormone production detection,  
57-58  
introduction, 57  
nature of  $\alpha$  hormones, 67-68  
novel mode of sexual  
reproduction  
chloramphenicol resistance  
control, 59-61  
genetic exchange absence,  
61  
oospore germination induc-  
tion, 59  
predicted genotypes, 60  
streptomycin resistance con-  
trol, 59-61  
potential effects on scientific  
thought, 70  
reversible change of induction  
type, 65-67  
regulation of induction  
types, 67  
sexual reproduction grouping,  
62-65  
hormonally regulated  
sexuality types, 63  
predicted sexuality types,  
64  
sexual reproduction regula-  
tion, 58
- substances stimulatory to sex-  
ual reproduction, 68-69  
Phytotoxins  
see Bacterial phytotoxins,  
self-protection mech-  
anisms  
Pigeonpea  
multiple disease resistance,  
208-10  
Plant disease diagnosis, 409-32  
conclusions, 425-26  
immunoassays in pathogen  
detection,  
colloidal gold, 412  
ELISA, 410-12  
immunoassay applications,  
416  
immunofluorescence assay,  
412  
immunoreagents, 413-16  
radioimmunoassay, 413  
technology, 409-13  
introduction, 409  
nucleic-acid hybridization,  
417  
detection techniques 417-21  
dot-blot assay, 418-19  
fungi, 424  
mycoplasma-like organisms  
and bacteria, 423-24  
nematodes, 424-25  
nonradioactive labels, 419-  
20  
nucleic acid probes, 421-25  
RFLPs, 420-21  
uncloned probes, 421-22  
viruses and viroids, 422-23  
Plant pathology, the changing  
scene, 1-13  
backdoor route, 2-4  
brave new world, 12-13  
demise of the compleat plant  
pathologist, 8-9  
evolution in action, 6-8  
introduction, 1  
legacies from the jungle, 4-6  
life with an inexact science,  
11-12  
on limiting skepticism, 9-11  
Polyethyleneimine, 420  
Polyethylene glycol 400, 458  
Polygalacturonases, 458  
*Polyscytium pustulans*, 451  
*Poria carbonica*, 82  
POTATO, 192  
verticillium wilt coupling, 196  
Potato  
growth models  
multilevel explanatory mod-  
els, 190-92  
same-level descriptive mod-  
els, 188-90  
Potato cyst nematodes  
pathotype recognition, 150  
population composition, 149-  
51  
Potato leaf roll virus  
detection, 426  
Potato spindle tuber viroid, 342  
DNA probes, 417-18, 422  
specificity, 418  
Potato virus Y  
capsoid protein, 125  
strain differentiation, 415  
Potato yellow dwarf virus, 337-  
38  
Potyviral gene products, expres-  
sion and function, 26:123-  
43  
gene products  
cytoplasmic amorphous in-  
clusion protein, 126-27  
cytoplasmic pinwheel inclu-  
sion protein, 126  
nuclear inclusion proteins,  
127-28  
virion-associated proteins,  
124-26  
genome organization, 128-33  
capsoid protein gene, 133  
cytoplasmic inclusion protein,  
131-32  
cytoplasmic pinwheel inclu-  
sion structures, 132  
genome map, 128-29  
large nuclear inclusion,  
protein, 132-33  
major cell-free translation  
products, 129-30  
small nuclear inclusion pro-  
tein, 132  
VPg, 132  
introduction, 123-24  
common features, 123  
proteins associated with in-  
fections, 124  
protein expression and pro-  
cessing  
deletion analyses of pro-  
teinase, 135  
polyprotein cleavage sites,  
135-38  
viral-encoded proteinase,  
133-35  
summary, 138-39  
Powdery mildew  
coupling to crop-growth mod-  
el, 193-94  
Powdery mildew of sugar beet  
predictive model, 195  
Probenazole, 274  
Prochloraz, 437-39  
postharvest disease control  
melon, 448

- persimmon, 442  
potato, 451-52  
Proline, 394  
Protease, 289-90  
  cloned genes, 288-89  
  export, 290-91  
Proteinase  
  potyvirus, 133-35  
    deletion analyses, 135  
Pseudobactin, 83  
Pseudocercospora cruenta, 211  
Pseudomonas  
  aeruginosa, 292  
  aureofaciens  
    antibiotics, 397  
    take-all suppression, 396  
  fluorescens, 381  
  antibiotics, 395-97  
  chemotaxis, 393  
  cropping history effect, 386  
  fimbriae, 392  
  flagella role in root colonization, 392-93  
  formulation for biocontrol, 383  
  Gaeumannomyces biocontrol, 76, 105, 382  
  HAC production, 397  
  Pythium suppression, 77, 81, 83, 105  
  root colonization, 386-91  
  marginalis, 302, 446  
  putida, 83, 381, 386  
    antibiotics, 396  
    chemotaxis, 393  
    Erwinia control, 77, 386  
    osmotolerance, 394  
    root colonization, 389-90  
  solanacearum, 79  
    cloned pectic enzyme gene, 288  
    endoglucanase, 288  
    extracellular polysaccharides, 292  
    induced resistance, 397  
    mutants, 295-96  
  syringae pv. glycinea, 304  
    avirulence genes, 303  
  syringae pv. phaseolicola, 304  
    mutants, 296  
    phaseolotoxin, 294  
    protection against toxin, 319, 322  
  syringae pv. pisi, 304  
    mutants, 296  
  syringae pv. savastanoi  
    plant growth substances, 293  
  syringae pv. syringae  
    mutants, 296  
  syringomycin, 314  
  toxins, 294  
  tagetis  
    protection against toxin, 321  
  syringae pv. tabaci, 304  
    mutants, 296  
    protection against toxin, 319-20, 322  
    root colonization, 325  
    tabtoxin, 293, 296  
    tabtoxin uptake, 318  
  syringae pv. tomato, 304  
    coronatine, 294  
Puccinia  
  coronata, 374  
  graminis f. sp. avenae, 353, 356  
  graminis f. sp. secalis, 364  
  graminis f. sp. tritici  
    disease prediction, 172  
    pyramiding host resistance genes, 373  
    see also Wheat stem rust  
      phenotypes, genetic control  
  recondita f. sp. tritici, 172  
    disease prediction, 172  
  sorgho  
    resistance gene cloning, 252-55  
  striiformis, 374  
    disease prediction, 173  
    inherited resistance, 370  
Pyoluteorin, 396  
Pyramiding major genes for resistance, 369-78  
  conclusions, problems, and the future, 375-77  
  introduction, 369-70  
  specific host/pathogen systems  
    crown rust/oats, 373  
    northern leaf blight/maize, 374-75  
    powdery mildew/wheat, 371-72  
    stem rust/wheat, 373  
    stripe rust/wheat, 374  
  terminology, 370-71  
Pyrenophora  
  graminea, 49  
  japonica, 49  
  teres, 49  
Pyricularia oryzae, 274  
Pyrrolnitrin, 396  
Pythium  
  aphanidermatum, 415  
    sexual reproduction stimulation, 69  
  synergism, 98  
  proliferum, 86  
  ultimum, 113  
  biocontrol, 77, 83, 105-6, 396  
  inoculum distribution, 228-29  
  soil compaction effect, 225-26  
  vexans  
    sexual reproduction stimulation, 69  
Q  
R  
Radioimmunoassay  
  pathogen detection, 413  
RFLP, 247, 254-55  
  fungal taxonomy, 424  
  nematode detection, 424-25  
  pathogen detection, 420-21  
Rhizobacteria, 381  
Rhizobitoxine, 321  
Rhizobium  
  japonicum, 321  
  fimbriae, 392  
  leguminosarum  
    cellulose fibrils, 391  
    nodulation genes, 300  
  meliloti 392  
    nodulation genes, 300  
Rhizoctonia  
  bataticola, 210  
  carotae, 450  
  cerealis, 83  
  solani, 80-81, 83-85, 95, 107, 113, 210, 446  
  biocontrol, 77, 105, 396  
  biocontrol lack, 386  
  ELISA, 416  
  endogenous energy effect, 100  
  gliotoxin sensitivity variation, 81  
  host predisposition, 103  
  synergism, 98  
  temperature effects on inoculum potential, 97  
Rhizopus  
  arrhizus, 440  
  circinans, 440  
  oryzae, 447  
  stolonifer, 439, 442, 446  
    control, 440  
Rhodamine isothiocyanate, 412  
Rice dwarf virus  
  replication in vector, 336  
RNA  
  versatility, 345  
Rofls, P. H., 17  
Root-knot nematodes, 155



## S

- Saccharobryopsis lipolytica*, 271
- Saccharomyces cerevisiae*, 317, 319
- Salmonella typhimurium*, 320, 424
- osmoprotectant, 394
- Satellite viruses, 342-44
- Sclerotinia*
- homoeocarpa*, 415-16
- sclerotiorum*, 448-50
- Sclerotium*
- cepivorum*, 80
- sclerotia stimulation, 100
- rolfsii*, 101, 381
- propagule debilitation, 110
- Septoria*
- apii*, 449
- nodorum*
- disease prediction, 173
- Serratia marcescens*, 291
- Shaw, M., 11
- Siderophores, 96, 106, 110
- role in biocontrol, 82-83, 395
- Sirococcus strobilinus*
- detection, 415
- Sodium di-
- methylidithiocarbamate, 448
- Soil borne plant pathogens, evolution of concepts, 93-121
- epilogue, 113-14
- inoculum potential, 96-97
- components, 97
- endogenous energy, 100-102
- exogenous energy, 99-100
- inoculum density, 98-99
- introduction, 93
- life history strategies, 95
- microbial interactions with pathogens, 104-5
- antibiosis, 105-6
- autolysis, 111
- carbon competition, 107-12
- coactions, 105-7
- competition, 106-7
- fungistasis, 106-10
- hyphal growth, 112
- nitrogen competition, 112-13
- parasitism and predation, 107
- persistent structure formation, 111
- propagule debilitation, 110-11
- substrate interactions, 107-13

- parasitizing pathogens and nonparasitizing exo-pathogens, 95-96
- ecological groups, 96
- predisposition, 102-4
- soil invaders and soil inhabitants, 93-95
- Soil compaction and crop residue effects on root health, 219-43
- conclusions, 239-40
- excessive compaction, 230-36
- effects, 230-31
- manifestations, 231
- porosity components as a function of water content, 231-32
- predicted iso-stress lines, 234
- predicted soil bulk density, 234-35
- soil water content, 233
- water movement, 233
- interactions of soil structure and compaction, 237-39
- anaerobic status, 238-39
- root growth in spaces between aggregates, 238
- spatial relationship between inoculum and root, 239
- introduction, 219-20
- pathogen ecology and root disease, 224-26
- root-pathogen interaction dynamics, 236-37
- soil compaction
- effects on root function and stress, 222-24
- inputs and processes affecting root health, 221
- mechanical resistance to root penetration, 223, 32
- terminology, 220-22
- typical field operations and compaction, 226-30
- dry bulk density of soil vs propagule densities, 229
- effects of axle loads and tillage on dry bulk densities, 230
- periods for field operations in a corn-coybean rotation, 228
- periods for field operations in a winter wheat-pea rotation, 227
- Sowthistle yellow vein virus, 337

- Soybean cyst nematodes, 152-55
- gene flow, 153-54
- index of parasitism, 154
- race identification, 153
- racess, 152-53
- Steeves, Taylor, 3
- Sterility mosaic of pigeonpea, 208-9
- Sterols
- Phytophthora* sexual reproduction stimulation, 68-69
- Stewart's bacterial wilt of corn prediction, 172
- Stover, Harry, 4
- Stowe, Bruce, 4
- Sireptomycetes*
- antibioticus*, 111
- hygroscopicus* var. *geldanus*, 396
- Streptomycin, 454
- Phytophthora* resistance, 59-61
- Sugarcane mosaic virus
- capsoid protein, 125
- Sulfur dioxide
- postharvest disease control, 443-45
- Suppressive soils, 113
- Swingle, W. T., 17
- Syngomycin, 294, 314
- complexed form, 316
- Syngotoxin, 294

## T

- Tabtoxin, 294, 296, 314, 317
- seal protection, 319-22
- Tagetitoxin, 321
- Talaromyces flavus*, 81
- biocontrol agent, 84
- glucose source, 85
- Taylor, Thomas
- role in history of American phytopathology, 25-28
- Temperature
- disease control, 455
- effect
- infection type of wheat stem rust, 363
- root colonization by pseudomonads, 390
- global change, 166-67
- Thiabendazole, 437, 439
- postharvest disease control
- cabbage, 448-49
- carrot, 450
- celery, 449
- melon, 448
- potato, 451
- sweet potato, 453
- yam, 452

- Thielaviopsis basicola*, 100  
suppression, 397
- Thimann, K. V., 3-4
- Trichoderma*  
*hamatum*, 86  
*harzianum*, 80, 83  
*viride*, 82, 85  
biocontrol, 77
- Thiophanate, 437
- Thiophanate-methyl, 439, 452  
postharvest disease control  
carrot, 450  
tomatoes, 446
- Thiram, 448
- Ti plasmid, 344
- Tobacco etch virus, 341  
capsid protein, 125  
cytoplasmic pinwheel inclusion protein, 126  
87 kd product, 129-30  
genome-linked protein, 125  
genome map, 128-29  
large nuclear inclusion protein, 132-33  
nuclear inclusion bodies, 336  
nuclear inclusion proteins, 127  
polyprotein expression and processing, 136  
proteinase, 133-34  
small nuclear inclusion protein, 132-33  
VPg, 132
- Tobacco mosaic virus, 338, 344  
coat-protein gene, 343  
homogeneity of proteins, 333  
inclusion bodies, 336  
infectious RNA, 334
- Tobacco ringspot virus, 345
- Tobacco vein mottling virus  
capsid protein, 125  
gene, 133  
genome expression, 128  
genome-linked protein, 125-26  
genome map, 129  
large nuclear inclusion protein, 132-33  
proteinase, 133-34  
75 kd product, 128-29  
small nuclear inclusion protein, 133  
VPg protein, 132
- Tomato ringspot virus, 340
- Toxins  
see Bacterial phytotoxins, self-protection mechanisms
- Triadimenol, 437
- Trichoderma harzianum*  
cellulase, 394
- Triarimol, 269
- Triforine, 269, 441
- U
- Uromyces*  
*appendiculatus*, 212  
*ciceris-arietini*, 206  
*fabae*, 214  
*phaseoli*, 212  
control, 278  
*pisi*, 212  
*viciae-fabae*, 212-13  
*Ustilago maydis*, 271
- V
- Vanderplank, J. E., 31-36  
honors, 35  
lecturer, 35  
outline of ideas, 34  
personality, 34-35  
training, 32
- Venturia inaequalis*, 80
- Verticillium dahliae*, 81, 83-84, 100  
effects on host physiology  
models, 196
- Verticillium wilt  
cotton  
predictive model, 195  
potato  
coupling to POTATO, 196
- Vibrio fischeri*, 302
- Vinclozolin, 439  
*Monilia* resistance, 442  
postharvest disease control  
cabbage, 449  
carrot, 450  
strawberry, 444  
tomato, 446
- Virginiamycin, 454
- Viridin, 82, 85
- Viridiol, 85
- Viroids, 342-43, 345  
detection, 422-23
- Virology, perspectives on progress, 331-50  
future prospects, 345-46  
introduction, 331-32  
landmarks from related sciences, 332-33  
nucleic acids, 333-34  
proteins, 333  
serology, 335  
recent landmarks  
eukaryotic *Chlorella*-like green algae infection, 341-42  
recombinant DNA techniques application, 342-45  
versatile RNA, 345  
viroids, virusoids, and satellite viruses, 342-43  
virusoids, 343-45  
unmarked landmarks, 335-36  
experimental hosts, 340  
inclusion bodies  
induction of mutations in maize, 338-39  
insect tissue cultures, 337-38  
mechanical transmission  
lack, 339  
noncapsid viral proteins, 340-41  
replication in vectors, 336-37
- Viruses  
detection, 422-23
- Virusoids, 342-43
- W
- Wallace, J. M., 19
- Webber, H. J., 17
- Wellman, Frederick, 2
- Welsh, John, 2
- Weston, W. H., 2-3
- Wheat mosaic virus, 338, 341
- Wheat spindle streak mosaic virus, 341
- Wheat stem rust phenotypes, genetic control, 351-67  
effect of other host genes, 356  
background effects, 360-62  
additive gene action, 357  
complementary gene action, 356  
effect of various combinations of resistance genes, 358  
host age effect, 362  
host ploidy effect, 358-62  
host tissue effect, 362  
reduction in disease response, 359  
residual effect, 357-58  
suppressors, 359  
environment effect, 362-63  
temperature, 363  
future, 364-65  
host-pathogen interaction, 352-53  
effect of host heterozygosity, 353-54  
effect of pathogen heterozygosity, 354

host response, infection  
type, and symptom de-  
scription, 352  
mean low infection types,  
353  
inheritance of pathogen viru-  
lence, 364  
introduction, 351  
specific host resistance genes,  
354-56  
low infection types result-  
ing from selected  
gene pairs, 355  
progressive increases in  
virulence, 356  
Western-X MLO, 423  
Wilson, Charles, 3  
WINDOW, 173-74  
Wound-tumor virus, 337-  
38

mechanical transmission lack,  
339

# X

Xanthin gum, 293, 384  
*Xanthomonas*  
*campestris* pv. *campestris*  
endoglucanase, 288  
extracellular enzymes ex-  
port genes, 289-91  
extracellular enzyme syn-  
thesis regulation, 289  
mutants, 297  
pectate lyase isozymes, 288  
plant-induced promoters,  
302  
protease, 288-89  
strain differentiation, 415

xanthin gum, 293  
*citri*  
control on fruit, 454  
*campestris* pv. *malvacearum*  
avrulence genes, 303  
*campestris* pv. *phaseoli*, 304  
*campestris* pv. *translucens*,  
288, 291, 304  
pathogenicity genes, 289  
*campestris* pv. *vesicatoria*  
avrulence gene, 304  
mutants, 297  
*campestris* pv. *vignicola*, 211  
*campestris* pv. *vitians*, 304  
plasmid profiles, 424

# Y

Yellowing viruses on sugar beet  
forecast, 173

# CUMULATIVE INDEXES

## CONTRIBUTING AUTHORS VOLS 1-26

### A

Abawi, G. S., 25:317-38  
 Adams, S. S., 21:341-62  
 Alcorn, J. L., 26:37-56  
 Allmaras, R. R., 26:219-43  
 Altman, J., 15:361-85  
 Anderson, N. A., 20:329-47  
 Anikster, Y., 17:367-403  
 Armentrout, V. N., 15:119-34  
 Aust, H.-J., 24:491-510  
 Ayres, P. G., 22:53-75

### B

Backman, P. A., 16:211-37  
 Baker, E. A., 18:85-101  
 Baker, K. F., 20:1-25, 21:13-20, 25:67-85  
 Bakker, A. W., 25:339-58  
 Bakker, P. A. H. M., 25:339-58  
 Baldwin, B. C., 26:265-83  
 Bangerth, F., 17:97-122  
 Barker, K. R., 19:21-28  
 Bashi, E., 16:83-101  
 Bell, A. A., 24:411-51  
 Benson, D. M., 17:485-502  
 Berger, R. D., 15:165-83  
 Beute, M. K., 17:485-502  
 Bitancourt, A. A., 16:1-18  
 Black, L. M., 19:1-19  
 Blakeman, J. P., 20:167-92  
 Bloomberg, W. J., 23:83-96  
 Boosalis, M. G., 19:167-87  
 Boothroyd, C. W., 20:41-47  
 Bové, J. M., 22:361-96  
 Brakke, M. K., 22:77-94  
 Brakke, M. K., 26:331-50  
 Browder, L. E., 23:201-50  
 Bruehl, G. W., 18:11-18  
 Bruening, G., 24:355-81  
 Buddenhagen, I. W., 21:385-409  
 Burdon, J. J., 20:143-66

### C

Campbell, C. L., 15:361-85, 21:385-409, 23:129-48  
 Carlson, G. A., 17:149-61  
 Carrington, J. C., 26:123-43  
 Carter, C. C., 21:271-88

Castellano, M., 22:331-59  
 Caswell, E. P., 23:275-96  
 Caten, C. E., 15:295-318  
 Chakravorty, A. K., 15:135-51  
 Chang, Y. H., 20:71-92  
 Chilvers, G. A., 20:143-66  
 Chiu, W. F., 20:71-92  
 Christie, R. G., 16:31-55  
 Clark, M. F., 19:83-106  
 Coakley, S. M., 26:163-81  
 Coffey, M. D., 24:311-38  
 Cohen, Y., 16:83-101, 24:311-38  
 Cole, R. J., 25:249-70  
 Collmer, A., 24:383-409  
 Connors, I. L., 18:19-25  
 Cook, R. J., 15:409-29  
 Cowling, E. B., 15:431-50  
 Crill, P., 15:185-202  
 Croll, N. A., 15:75-89  
 Cummins, G. B., 16:19-30  
 Curl, E. A., 18:311-32  
 Czochor, R. J., 18:237-58

### D

Dahlberg, K. R., 20:281-301  
 Daly, J. M., 22:273-307  
 Daniels, M. J., 21:29-43  
 Daniels, M. J., 26:285-312  
 Daub, M. E., 24:159-86  
 Davidse, L. C., 24:43-65  
 Davis, J. M., 25:169-88  
 Davis, M. J., 24:115-40  
 Davis, R. E., 24:339-54  
 Day, A. W., 15:295-318  
 de Bruin-Brink, G., 24:27-31  
 DeBoer, S. H., 23:321-50  
 Diener, U. L., 25:249-70  
 Dinoo, A., 22:443-66  
 Djordjevic, M. A., 25:145-68  
 Dodds, J. A., 22:151-68  
 Dollet, M., 22:115-32  
 Dougherty, W. G., 26:123-43  
 Doupinik, B. Jr., 19:167-87  
 Dow, J. M., 26:285-312  
 Drew, M. C., 18:37-66  
 Dropkin, V. H., 26:145-61  
 Dubin, H. J., 19:41-49  
 Duke, W. B., 16:431-51  
 Dunaway, J. M., 17:431-60  
 Durbin, R. D., 26:313-29

### E

Ebel, J., 24:235-64  
 Eckert, J. W., 23:421-54  
 Eckert, J. W., 26:433-69  
 Edens, T. C., 20:363-95  
 Edgington, L. V., 19:107-24  
 Edwardson, J. R., 16:31-55  
 Eisenback, J. D., 21:271-88  
 Ellingboe, A. H., 19:125-43, 25:59-66  
 Ellis, J. G., 26:245-63  
 Epstein, A. H., 16:181-92  
 Ercolani, G. L., 22:35-52  
 Eshed, N., 22:443-66  
 Estey, R. H., 24:17-25  
 Evans, L. S., 22:397-420

### F

Fahy, P. C., 24:93-114  
 Ferris, H., 19:427-36  
 Fischer, G. W., 21:13-20  
 Fokkema, N. J., 20:167-92  
 Foster, G. H., 17:343-66  
 Foster, R. C., 24:211-34  
 Fravel, D. R., 26:75-91  
 Freckman, D. W., 23:275-96  
 Frederiksen, R. A., 15:249-75, 22:247-72  
 French, R. C., 23:173-200  
 Fulton, J. P., 25:111-23  
 Fulton, R. W., 18:131-46, 22:27-34, 24:67-81

### G

Gabriel, D. W., 25:145-68  
 Gardner, M. W., 15:13-15  
 Garrett, S. D., 19:29-34, 23:13-18  
 Gergerich, R. C., 25:111-23  
 Ghabrial, S. A., 18:441-61  
 Gibbs, J. N., 16:287-307  
 Giebel, J., 20:257-79  
 Gilligan, C. A., 21:45-64  
 Goldbach, R. W., 24:289-310  
 Gould, A. R., 21:179-99  
 Grace, J. K., 26:25-28  
 Graen, V. E., 20:219-33  
 Grainger, J., 17:223-52  
 Graves, L. B. Jr., 15:119-34  
 Green, G. J., 18:19-25

Gregory, P. H., 15:1-11  
 Griffin, D. M., 15:319-29  
 Griffin, G. D., 19:21-28  
 Griffiths, E., 19:69-82  
 Grogan, R. G., 19:333-51,  
 25:1-8

# H

Halk, E. H., 23:321-50  
 Hancock, J. G., 19:309-31  
 Harris, K. F., 15:55-73,  
 19:391-426  
 Harris, M. K., 22:247-72  
 Harrison, B. D., 15:331-60,  
 23:55-82  
 Hart, J. H., 19:437-58  
 Harvey, J. M., 16:321-41  
 Hau, B., 18:67-83  
 Haynes, D. L., 20:363-95  
 Heath, M. C., 18:211-36  
 Hepting, G. H., 15:431-50  
 Hewitt, W. B., 17:1-12, 25:41-  
 50  
 Hildebrand, D. C., 20:235-56  
 Hirano, S. S., 21:243-69  
 Hirschmann, H., 18:333-59  
 Hoch, H. C., 25:231-47  
 Hoitink, H. A. J., 24:93-114  
 Hopkins, D. L., 15:277-94  
 Hornby, D., 21:65-85  
 Horne, W. H., 19:51-67  
 Horsfall, J. G., 17:29-35,  
 20:27-32  
 Horst, R. K., 22:21-26  
 Huang, J.-s., 24:141-57  
 Huisman, O. C., 19:309-31,  
 20:235-56, 303-27  
 Hulbert, S. H., 25:383-404

# J

Jackson, R. D., 24:265-87  
 Jacobsen, B. J., 21:137-52  
 Jansson, H. B., 22:95-113  
 Jatala, P., 24:453-89  
 Johnson, M. C., 25:293-313  
 Johnson, R., 22:309-30  
 Johnson, T., 18:19-25  
 Jordan, R. L., 22:151-68

# K

Katan, J., 19:211-36  
 Keen, N. T., 24:383-409  
 Kelman, A., 15:409-29,  
 18:361-87, 23:1-11  
 Kent, G. C., 17:21-28  
 Kerling, L. C. P., 24:27-31  
 Kern, H., 23:19-22  
 Kerr, A., 25:87-110  
 Kirk, T. K., 18:259-88  
 Kiyosawa, S., 20:93-117

Klich, M. A., 25:249-70  
 Ko, W., 26:57-73  
 Kohmoto, K., 21:87-116  
 Kolattukudy, P. E., 23:223-50  
 Kotoujansky, A., 25:405-30  
 Kraft, J. M., 26:219-43  
 Kranz, J., 18:67-83  
 Kuijt, J., 15:91-118

# L

Lacy, G. H., 17:181-202  
 Langston-Unkefer, P. J.,  
 26:315-29  
 Latch, G. C. M., 25:293-313  
 Laurence, J. A., 19:257-71  
 Lawrence, G. J., 26:245-63  
 Leary, J. V., 17:181-202  
 Leath, S., 26:369-78  
 Leben, C., 19:35-40  
 Lee, I. M., 24:339-54  
 Lee, L. S., 25:249-70  
 Leonard, K. J., 18:237-58  
 Leong, J., 24:187-209  
 Linderman, R. G., 17:253-77  
 Lindow, S. E., 21:363-84  
 Lockwood, J. L., 26:93-121  
 Loegering, W. Q., 16:309-20,  
 25:59-66  
 Loomis, R. S., 21:341-62  
 Lumsden, R. D., 18:389-413  
 Luttrell, E. S., 19:373-89  
 Lyda, S. D., 16:193-209  
 Lynch, J. M., 18:37-66

# M

Mai, W. F., 25:317-38  
 Mamiya, Y., 21:201-20  
 Mankau, R., 18:415-40  
 Markham, R., 15:17-39  
 Marks, G. C., 25:207-29  
 Martin, R. R., 26:409-32  
 Mathys, G., 18:85-101  
 Matthews, R. E. F., 25:11-23  
 Maxwell, D. P., 15:119-34  
 Mayo, M. A., 20:49-70  
 McDonald, D., 21:153-78  
 Merrill, W., 16:239-61  
 Mew, T. W., 25:359-82  
 Michelmores, R. W., 25:383-  
 404  
 Miller, D. E., 26:219-43  
 Miller, S. A., 26:409-32  
 Mills, D., 23:297-320  
 Mitchell, R. E., 22:215-45  
 Molina, R., 22:331-59  
 Moore, L. W., 17:163-79  
 Moreno, R. A., 23:491-512  
 Morris, T. J., 22:151-68  
 Munnecke, D. E., 17:405-29  
 Murant, A. F., 20:49-70  
 Musselman, L. J., 18:463-89

# N

Neergaard, P., 24:1-16  
 Nelson, R. R., 16:359-78,  
 22:11-19  
 Nene, Y. L., 26:203-17  
 Newhall, A. G., 18:27-36  
 Nienhaus, F., 17:37-58  
 Nishimura, S., 21:87-116  
 Noe, J. P., 23:129-48  
 Noffsinger, E. M., 19:21-28  
 Norton, D. C., 17:279-99

# O

Ogawa, J. M., 23:421-54,  
 26:433-69  
 Ogoshi, A., 25:125-43  
 Osbourn, A. E., 26:285-312  
 Ou, S. H., 18:167-87, 22:1-10  
 Ouchi, S., 21:289-315

# P

Panopoulos, N. J., 23:381-419  
 Papavizas, G. C., 18:389-413,  
 23:23-54  
 Parlevliet, J. E., 17:203-22  
 Pasternak, D., 25:271-91  
 Payne, G. A., 25:249-70  
 Peacock, W. J., 26:245-63  
 Pedersen, W. L., 26:369-78  
 Peet, R. C., 23:381-419  
 Perombelon, M. C. M.,  
 18:361-87  
 Pirone, T. P., 15:55-73  
 Ponz, F., 24:355-81  
 Posnette, A. F., 18:1-9  
 Pound, G. S., 25:51-58  
 Powers, H. R. Jr., 19:353-71  
 Prescott, J. M., 16:263-85  
 Pryor, A. J., 26:245-63  
 Punja, Z. K., 23:97-128  
 Purcell, A. H., 20:397-417  
 Putnam, A. R., 16:431-51

# R

Rapilly, F., 17:59-73  
 Rathmell, W. G., 26:265-83  
 Reinert, R. A., 22:421-42  
 Renfro, B. L., 15:249-75  
 Robinson, R. A., 18:189-210  
 Rodriguez-Kabana, R., 18:311-  
 32  
 Roelfs, A. P., 26:351-67  
 Rolfe, B. G., 25:145-68  
 Rotem, J., 16:83-101  
 Rouse, D. I., 26:183-201

# S

Saari, E. E., 16:263-85  
 Sanders, T. H., 25:249-70

Sasser, J. N., 21:271-88  
 Schaad, N. W., 17:123-47  
 Schein, R. D., 26:31-36  
 Schippers, B., 25:339-58  
 Schmidt, R. A., 19:353-71  
 Schroth, M. N., 20:235-56  
 Schwarzbach, E., 16:159-80  
 Scott, H. A., 25:111-23  
 Seem, R. C., 22:133-50  
 Semancik, J. S., 17:461-84  
 Sequeira, L., 16:453-81, 26:1-13  
 Shaner, G., 19:273-96  
 Shaw, M., 15:135-51  
 Shepard, J. F., 19:145-66  
 Shephard, M. C., 25:189-206  
 Sherwood, R. T., 18:259-88  
 Shigo, A. L., 22:189-214  
 Shipton, P. J., 15:387-407  
 Shoemaker, R. A., 19:297-307  
 Siegel, M. R., 25:293-313  
 Sikora, R. A., 17:37-58  
 Simons, J. N., 18:289-310  
 Simons, M. D., 17:75-96  
 Skye, E., 17:325-41  
 Skylakakis, G., 21:117-35  
 Smedegaard-Petersen, V., 23:475-90  
 Smith, R. J. Jr., 17:301-10  
 Snow, G. A., 19:353-71  
 Sprague, G. F., 18:147-65  
 Staples, R. C., 25:231-47  
 Starr, M. P., 22:169-88  
 Stover, R. H., 24:83-91  
 Sumner, D. R., 19:167-87  
 Symons, R. H., 21:179-99  
 Szkolnik, M., 16:103-29

## T

Talbot, P. H. B., 15:41-54  
 TeBeest, D. O., 17:301-10  
 Templeton, G. E., 17:301-10  
 ten Houten, J. G., 24:27-31  
 Teng, P. S., 23:351-80  
 Thresh, J. M., 20:193-218  
 Thurston, H. D., 15:223-47  
 Tietz, H., 16:343-58  
 Tolmsoff, W. J., 21:317-40  
 Tolstrup, K., 23:475-90  
 Tomiyama, K., 21:1-12  
 Torres, E., 19:41-49  
 Toussoun, T. A., 24:17-25  
 Trappe, J. M., 15:203-22, 22:331-59  
 Triantaphyllou, A. C., 18:333-59, 21:271-88  
 Tuite, J., 17:343-66

## U

Upper, C. D., 21:243-69

## V

V. Hoynningen-Huene, J., 24:491-510  
 Van Alfen, N. K., 20:349-62  
 Van Eiten, J. L., 20:281-301  
 Van Gundy, S. D., 17:405-29  
 Van Regenmortel, M. H. V., 16:57-81  
 Vance, C. P., 18:259-88  
 Vanfleteren, J. R., 16:131-57

## W

Wahl, I., 17:367-403  
 Walker, J. C., 17:13-20, 20:33-39  
 Wallace, H. R., 16:379-402  
 Warren, G., 17:163-79  
 Weinstein, L. H., 19:257-71  
 Weller, D. M., 26:379-407  
 Wellman, R. H., 15:153-64  
 Wenzel, G., 23:149-72  
 Weste, G., 25:207-29  
 Wheeler, M. H., 24:411-51  
 Wiese, M. V., 20:419-32  
 Wilcox, H., 21:221-42  
 Wilhelm, S., 16:343-58, 20:27-32  
 Williams, P. H., 17:311-24  
 Williams, R. J., 21:153-78  
 Wolfe, M. S., 16:159-80, 23:251-74  
 Woltz, S. S., 16:403-30  
 Wood, R. K. S., 25:27-40  
 Wynn, W. K., 19:237-55

Y

Yoder, O. C., 18:103-29  
 Young, H. C. Jr., 16:263-85

Z

Zadoks, J. C., 23:455-74, 26:31-36  
 Zentmyer, G. A., 26:17-21  
 Zeyen, R. J., 20:119-42  
 Zitter, T. A., 18:289-310  
 Zuckerman, B. M., 22:95-113

